

Warm Up # 1-4

Sit in same team as yesterday.

Thursday Space:

Enter the data into a list on your calculator to use for the lesson later today:

STAT

EDIT

 L_1

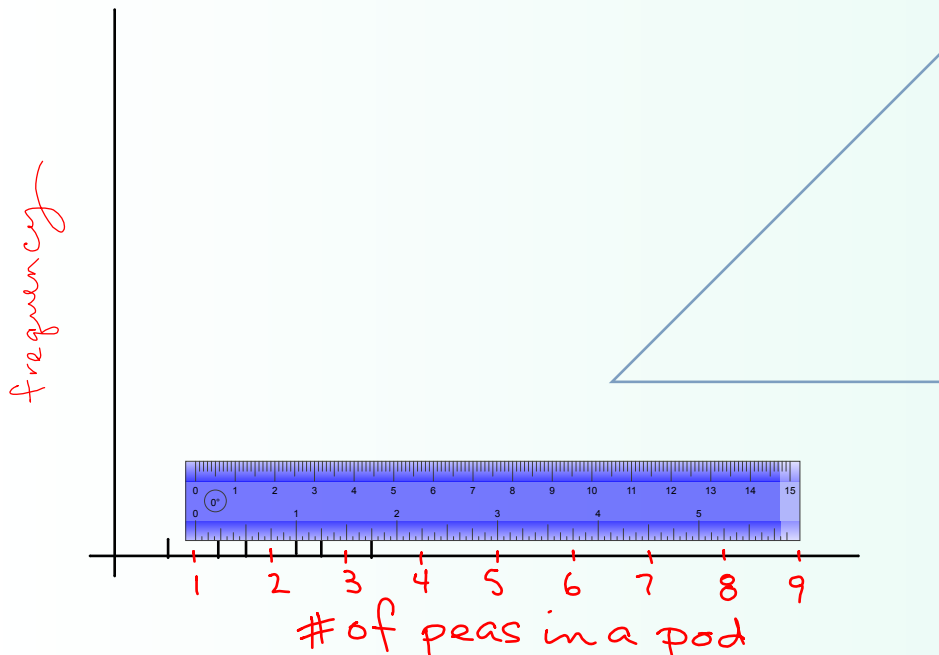
121, 65, 45, 130, 150, 83, 148,

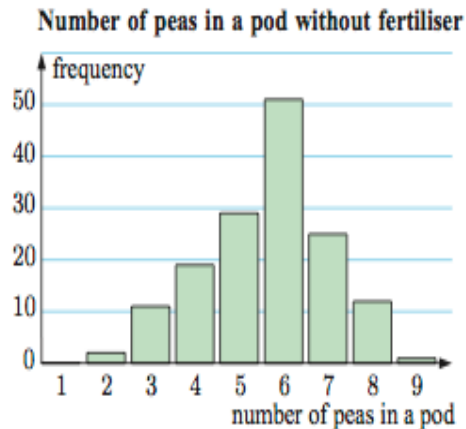
137, 20, 173, 56, 49, 104, 97

Write down the range and the median of the data, then continue work on yesterday's classwork with your team.

Create a column graph (bar graph) to display the data.

Use a measuring scale to be as accurate as possible.





Homework Questions:

EXERCISE 6A

- 1** Classify the following variables as categorical, quantitative discrete, or quantitative continuous:
- a** the number of brothers a person has
 - b** the colours of lollies in a packet
 - c** the time children spend brushing their teeth each day
 - d** the height of trees in a garden
 - e** the brand of car a person drives
 - f** the number of petrol pumps at a service station
 - g** the most popular holiday destinations

Ans:

- | | |
|----------------------------------|----------------------------------|
| a quantitative discrete | b categorical |
| c quantitative continuous | d quantitative continuous |
| e categorical | f quantitative discrete |
| | g categorical |

- 2** For each of the variables in **1**:
- if the variable is categorical, list some possible categories for the variable
 - if the variable is quantitative, give the possible values or range of values the variable may take.

EXERCISE 6B

- 1 In the last football season, the Flames scored the following numbers of goals in each game:

2 0 1 4 0 1 2 1 1 0 3 1
3 0 1 1 6 2 1 3 1 2 0 2

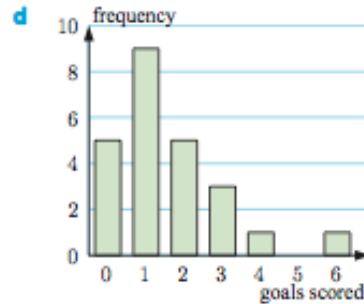
- a What is the variable being considered here?
- b Explain why the data is discrete.
- c Construct a frequency table to organise the data. Include a column for relative frequency.
- d Draw a column graph to display the data.
- e What is the modal score for the team?

answers:**ANSWER 6B**

- a the number of goals scored in a game
- b variable is counted, not measured

c

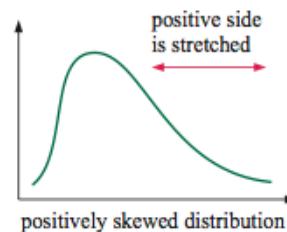
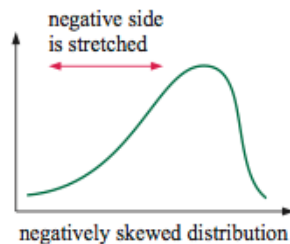
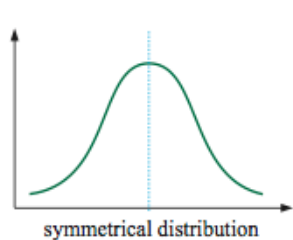
Goals scored	Tally	Frequency	Rel. Frequency
0		5	0.208
1		9	0.375
2		5	0.208
3		3	0.125
4		1	0.042
5		0	0
6		1	0.042
Total		24	



- e 1 goal
- f positively skewed, one outlier, (6 goals)
- g $\approx 20.8\%$

Describing a Distribution

The descriptions we use are:



- 3 While watching television, Joan recorded the number of commercials in each break. She obtained these results:

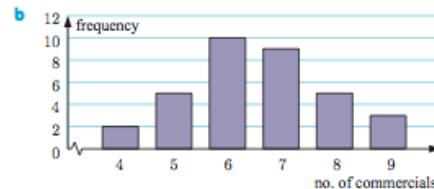
5 7 6 4 6 5 6 7 5 8
7 6 9 8 7 6 6 9 6 7
6 4 7 5 8 7 6 8 7 8
5 6 9 7

- Construct a frequency table to organise the data.
- Draw a column graph to display the data.
- Find the mode of the data.
- Describe the distribution. Are there any outliers?
- What percentage of breaks contained at least 6 commercials?

Answers:

3 a

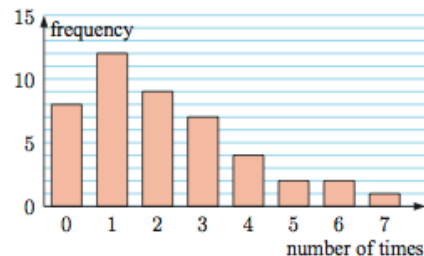
No. of commercials	Tally	Frequency
4		2
5		5
6		10
7		9
8		5
9		3
Total		34



- c 6 commercials d symmetrical, no outliers e $\approx 79.4\%$

- 4 A random sample of people were asked "How many times did you eat at a restaurant last week?" A column graph was used to display the results.

- How many people were surveyed?
- Find the mode of the data.
- How many people surveyed did not eat at a restaurant at all last week?
- What percentage of people surveyed ate at a restaurant more than three times last week?
- Describe the distribution of the data.



Answers:

- a 45 b 1 time c 8 d 20%
e positively skewed, no outliers

C

GROUPED QUANTITATIVE DISCRETE DATA

A local kindergarten is concerned about the number of vehicles passing by between 8:45 am and 9:00 am. Over 30 consecutive week days they recorded data:

27, 30, 17, 13, 46, 23, 40, 28, 38, 24, 23, 22, 18, 29, 16,
35, 24, 18, 24, 44, 32, 52, 31, 39, 32, 9, 41, 38, 24, 32

In situations like this there are many different data values with very low frequencies. This makes it difficult to study the data distribution. It is more statistically meaningful to group the data into **class intervals** and then compare the frequency for each class.

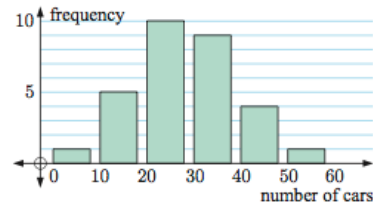
For the data given we use class intervals of width 10. The frequency table is shown opposite.

We see the **modal class**, or class with the highest frequency, is from 20 to 29 cars.

Number of cars	Tally	Frequency
0 to 9		1
10 to 19		5
20 to 29		10
30 to 39		9
40 to 49		4
50 to 59		1
Total		30

We can construct a **column graph** for grouped discrete data in the same way as before.

Vehicles passing kindergarten
between 8:45 am and 9:00 am



D

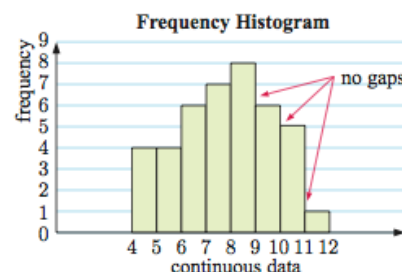
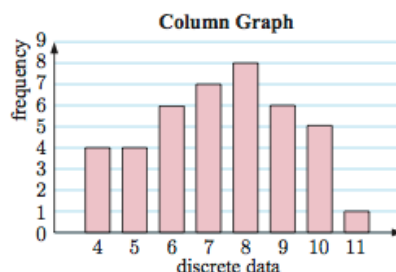
QUANTITATIVE CONTINUOUS DATA

When we measure data that is **continuous**, we cannot write down an exact value. Instead we write down an approximation which is **only as accurate as the measuring device**.

Since no two data values will be *exactly* the same, it does not make sense to talk about the frequency of particular values. Instead we group the data into **class intervals of equal width**. We can then talk about the frequency of each class interval.

A special type of graph called a **frequency histogram** or just **histogram** is used to display grouped continuous data. This is similar to a column graph, but the 'columns' are joined together and the values at the edges of the column indicate the boundaries of each class interval.

The **modal class**, or class of values that appears most often, is easy to identify from a frequency histogram.



How many class intervals should you use?

How do you decide what is appropriate for the situation?

How many class intervals should you use?

If n = number of individual data values,
then start with $\approx \sqrt{n}$ class intervals.

How do you decide what is appropriate for the situation?

Look at the low and high of your data and make the intervals easy...

Have the intervals go by numbers like:

2, 5, 10, 25, 200...

rather than numbers like:

4.2, 7, 113...


Exploring the data from the warm up:

saved in TI 84 data file under 6E

Example 5 from p. 172

A teenager recorded the time (in minutes per day) he spent playing computer games over a 2 week holiday period: 121, 65, 45, 130, 150, 83, 148, 137, 20, 173, 56, 49, 104, 97.

Using technology to assist, determine the mean and median daily game time the teenager recorded.



The mean $\bar{x} \approx 98.4$ minutes, and the median = 100.5 minutes.

HW 1-4: (Week 1, Day 4 is Thursday)

6C p.166 # 1, 2

6D p.168 # 3, 5